4-H Youth Development

2000 Programs of Excellence

Science & Technology

4-H Science Discovery Kits
New Jersey

Situation
Many studies have found that youth are turned off by science before they even get out of grade school. In 1993, the American Academy for the Advancement of Science (AAAS) released *Benchmarks for Science Literacy*, which urged teachers to cut the amount of material taught and focus on hands-on projects. In 1994, several New Jersey 4-H faculty and staff conducted a needs assessment and as a result, developed a series of self-contained "4-H Science Discovery Kits" to help 4-H club leaders, other volunteers, and teachers provide science lessons to youth using a fun, learn-by-doing approach.

Program Description
Each Science Discovery Kit contains a lesson plan and nearly all of the teaching materials needed to teach the lesson in a hands-on way. The kits can be borrowed free-of-charge from NJ Extension offices and are aimed at teaching youth, grades 2-8, in group settings such as 4-H clubs and school classrooms. Topics offered are: Geology Where You Live (rocks & minerals), Don't Trash The Planet! (recycling/solid waste), Tree-Mendous Fun, As Big As A Whale!, Good To The Last Drop (water quality & conservation). Twenty-three sets were created and are being used by Extension staff in all NJ counties and the NJ 4-H Outdoor Education Center. Besides the kits, 4-H staff were provided support materials, including lesson plans, news releases, newsletter articles, and evaluation forms.

Stakeholder Satisfaction
A "Leader Lesson Guide" was created to allow others to replicate the Science Discovery Kits based on the lesson plans and list of materials needed. It was selected by a jury for acceptance into the National 4-H Curriculum Collection. Due to the popularity of the curriculum, a second volume is near

completion. Since the kits were intended to be used by a variety of audiences, they have received the favorable attention of multiple organizations, including:

- Seminars presented at the National Association Extension 4-H Agents (NAE4-HA) national conference, Alliance for NJ Environmental Education (ANJEE) conference, NJ. Council for Elementary Science Teacher conference, Pennsylvania Alliance for Environmental Education conference.
- Articles in NAE4-HA News & Views, New Jersey Science Teachers Association newsletter, and Sciencing an electronic newsletter produced by Cornell University.

Accomplishments and Impacts

The curriculum was tested with 252 boys and girls, various racial-ethnic backgrounds, grades 1-8. It was used with 16 different groups, in School Enrichment, After School/School-Age Child Care (SACC), 4-H Club, 4-H Camp, and Special Interest settings. Group leaders included staff, volunteers, and school teachers. Group leaders rated the curriculum as follows:

- Sixty-threepercent said the lesson used was Very Effective in meeting its objectives, 37% Somewhat Effective. (0% Somewhat Ineffective or Very Infective)
- Fifty-threepercent said the lesson and its activities were Very Easy to learn, understand, and teach. 40% Somewhat Easy, 7% Somewhat Difficult. (O% Very Difficult.)
- Since then, the kits and printed curriculum have been used with hundreds of other youth in New Jersey and elsewhere, with similar results found.

Resource Committment

Twenty-four hundred dollars ($2,400) Rutgers Cooperative Extension Innovative Programs grant assisted with development.
Twenty-five hundred dollars ($2,500) grant from Bristol-Myers-Squibb assisted with publishing the printed curriculum. It is self-sustaining through purchases by users to cover costs. An accompanying web site (http://www.sciencediscovery.rutgers.edu) has been developed to support the curriculum by providing educators with additional resources and links.

Collaborators

The development team consisted of Keith G. Diem, Laura K. Bovitz, Betty Jean Jesuncosky, Mary Lou Mayfield, Jim Nichnadowicz, Jeannette Rae-Keywood; who are all Extension faculty and staff. Bristol-Myers-Squibb contributed to the effort through NJ 4-H Development Fund.

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Food System Education
Pennsylvania

Situation
Although agriculture is the largest business in Pennsylvania, most Pennsylvania children no longer live on farms. Their knowledge of food production and food systems is often limited to their trips to the grocery store. In order to provide an opportunity for children to learn more about the food system and agriculture, this project was developed.

Program Description
This project provided an innovative approach to elementary-aged food systems education through learner centered educational experiences for each first through sixth grade student in three counties of Pennsylvania. During the learner-centered lessons, students learned: 1) basic concepts of wool production and processing; 2) basic concepts in milk production and dairy product processing; 3) basic concepts about honey production and the critical role that bees have in food production through their pollination efforts; 4) the role corn by-products play; 5) about the food production and processing industries in Pennsylvania and associated career opportunities; and 6) economic, geographical and climatological concepts affecting the national food production, processing, transportation, and retailing systems. This project was completed for the fourth time in the 2000 program year. Teens are trained to present the actual classroom lessons.

Stakeholder Satisfaction
Classroom teachers rated 85 percent of the teen presentations as excellent. Teachers were asked to rate the quality, preparedness, confidence, educational value, and appropriateness of the teen presenter and the actual material presented. One teacher stated, "Very informative curriculum. The teens did a great job of relating to the students. We need to think about our agricultural background."

Accomplishments and Impacts
This past year, 6,371 students in three Pennsylvania counties participated in the program. Fifty-two 4-H teen volunteers were trained to teach the lessons. Library resources were provided for each of the lessons that were taught. The schools have

been cooperating for four years and now have in their library 20 books on some aspect of the food system. Teen presenters were evaluated at the completion of the project. Responses to this evaluation showed that teens felt this project improved their life skills in the areas of communications, teamwork, planning and organizing, cooperation, and decision making.

Resource Committment
This project is supported by a Keystone 21 grant.

Collaborators
The project has been built on collaborative partnerships between Penn State Cooperative Extension offices in Perry, Juanita, and Mifflin Counties and the seven public school districts within those counties.

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Atlantic City Housing 4-H Summer Day Camp Science Program
New Jersey

Situation
An estimated 15.4% of Atlantic County's children live below the poverty level, with a large concentration of low-income residents in Atlantic City. Child poverty leads to early school drop out, lack of job preparedness, and arrests for crimes—often of a violent nature. Atlantic City's 10.5% drop out rate (the state average is 3.8%) and ranking of 13 out of 21 counties in juvenile arrests indicate a need to provide opportunities for youth to develop social skills, while gaining valuable learning skills to enrich their formal educational experiences.

Program Description
The target audience was youth, grades 3 through 8, living in the at-risk community of Atlantic City.

The purpose of the program was to enable participants to:

1. Learn the operational processes of science - observing, communicating, comparing, organizing, relating, inferring, and applying – through hands-on sciencing experiences.
2. Develop skills for obtaining and analyzing information.
3. Develop the skills necessary to raise questions, to think creatively, and frame solutions to problems.
4. Develop social skills and the ability to work with others through working in teams.

Each of the five Atlantic City Housing Authority project sites' summer day camp programs participated in 8-week sessions – one session per week. Each participant was required to attend the weekly sessions. Hands-on activities from the SPACES-Preparing Kids for a High Tech Global Future and 4-H SERIES were used to develop science, problem solving, personal development, and interpersonal skills. Group games and challenges were also implemented to develop teamwork and cooperation skills.

Stakeholder Satisfaction
Stakeholders have continued to request 4-H to implement hands-on science activities as part of their summer day camp program.

Accomplishments and Impacts
To date, 1,347 youth participated in two 8-week sessions. The youth involved increased their knowledge of science skills. They also increased their awareness of science in their everyday lives. The participants also found that science can be fun and interesting if it's hands-on. Through working groups, the youth were able to accept differences, utilize individual skills in team efforts, and develop communication skills.

Resource Committment
A total of $5013.81 was provided by the Atlantic City Housing Authority.

Collaborators
Atlantic City Housing Authority (funds; counselors provided by individual housing project sites)

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Soweto Academy 4-H Computer Skills Class
New Jersey

Situation
Low-income families seldom have home computers or access to the Internet. Schools have computers that are not always available for individual students. Therefore, although most children have basic computer skills, they have few chances to practice them or to use the Internet.

Program Description

Minority children, grades 4 to 6, living in an urban housing project in Newark increased basic computer skills by developing personal web pages and participating in a pilot program for the National 4-H Computer Curriculum. The CYFAR/State Strengthening Grant provided an online computer. The Tenants Association of the housing project acquired a grant to set up a computer lab adjacent to the afterschool program, and made it available for Soweto staff and students. 4-H program staff, assisted by two volunteers, conducted computer classes using both the computer lab and the online computer. The classes met for 1.5 hours weekly from March to June. The students created their own web pages and helped younger children learn basic computer skills. Offline educational activities were provided with the "Reader Rabbit" computer program and the Internet edition of "The Flicker" magazine.

Stakeholder Satisfaction

By piloting the 4-H curriculum on the Internet, the participants learned that their experience and opinions are valued, at the same time that they used the Internet as a learning tool. There were 10 classes, with an average participation of 8 students in each class. Of the 14 students who participated in 3 or more classes, the average attendance was over 5 classes.

Accomplishments and Impacts

The students pilot-tested the "Computer Detective" national 4-H curriculum. Most of the 10 children who participated online enjoyed the activities, learned something new, wanted to learn more, planned to share what they learned with family or friends, and would tell their friends to enroll in the project. They learned how to categorize computer devices, how to identify URL and e-mail addresses, and how people use computers in their jobs. The primary life skills they learned were: understanding systems, making decisions, and practicing integrity. They also learned how to use a mouse and how to use the keyboard to write a letter (story). Students commented that they found the activities "fun and educational." One volunteer used his experience working with children to find a paid position in a partner youth program.

Resource Committment

The computer lab was provided by Hope VI funding; the online computer was provided by CYFAR/State Strengthening funds. EdPress provided copies of the Internet edition of "TheFlicker" magazine for children.

Collaborators

Soweto Academy, Inc; Newark Housing Authority Hope VI Program, Walsh Homes Tenants Association, University of Kentucky, Purdue University, NJ Strengthening Families

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Other Base Program Areas This Program Applies To
Leadership & Volunteer Development

4-H Science-Sational Day
New Jersey

Situation
Many studies have found that youth are turned off by science by the time they reach the fifth grade. 4-H responded by developing an extremely popular program to promote an interest in science and math and show that learning can be fun. It also aimed to promote a contemporary image of 4-H and Cooperative Extension to the general public, media, and government officials.

Program Description
4-H Science-sational Day has been held for ten consecutive years as a Saturday of science fun for nearly 300 youth, grades 1-9, and their parents. Dozens of hands-on workshops with creative names, such as "Who dirtied the water?," "Rain, Snow, Sun - what will it be?" and "Chemistry Wizardry," are offered annually. Older youth could choose a trip to the Buehler Challenger Center to simulate a space mission. Overall, this program has reached over 2,500 participants from the mostly suburban Somerset County and central NJ area. It has attracted a balance of boys and girls; two-thirds were not 4-H club members.

Stakeholder Satisfaction
The program has received favorable evaluation and media attention, and enrollment is annually filled to capacity before registration deadlines. County, state, and federal officials have attended and sent letters congratulating 4-H on the superior program it offered.

Accomplishments and Impacts
This program has used end-of-program written evaluation, as well as casual observation, and participation trends to indicate its benefits and impacts. Evaluation has consistently shown:

- Ninety-fourpercent of participants rated 4-H Science-sational Day as "Great" or "Good."
- Ninety percent said they learned "A lot" or "Some" about science.

- Seventy-sixpercent said they were "More" interested in science after attending 4-H Science-sational Day; 21% said they were just as interested afterward as before.
- Eighty-six percent would like to come to 4-H Science-sational Day again. (23% attended the prior year also.)

Resource Committment
The program is self-supporting by charging participants a nominal registration fee. While Extension staff organized and assisted with the delivery of this program, nearly all of the workshops were taught by local volunteers, keeping costs low and grassroots involvement high.

Collaborators
Cooperators have included: 4-H youth and adult volunteers, volunteers from Ethicon, National Starch, and other "science-focused" companies; Extension Master Gardeners; local & State Police; County Sheriff; school teachers; New Jersey Math & Science Coalition; Soil Conservation staff; local real estate companies; McDonald's Corporation; Delaware Valley Raptor Center; Franklin Science Institute.

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Lego Mindstorms Robotics Camp
Pennsylvania

Program Description
Penn State Continuing Education in Abington and Penn State Cooperative Extension in Bucks County ran a week long computer enrichment camp for children, entering grades 5 and 6. The program was held on the Abington campus the week of June 26, 2000 from 9:00 a.m. to 3:00 p.m. The program was based on a popular robotics kit, Lego Mindstorms. In the hands-on workshop, campers, through the use of Lego parts combined with a computer interface, designed their own robot inventions. They combined Lego motors, sensors and computer software to create moving robots that react to light, avoid obstacles, and do amazing things. The 15 participants were from the Clara Barton Elementary School, located in Levittown, Pennsylvania. Pat Freiler, 4-H Coordinator in Bucks

County, has a great working relationship with the school's principal, Ken McKinney, who coordinated the selection of students. Also, one of the teachers in the gifted program at Clara Barton, Dawn Petrik, worked as a camp assistant. Dawn was eager to learn about the program and use the knowledge gained in her classroom next year.

Stakeholder Satisfaction

One goal was to introduce a new audience to the Penn State University Abington campus and the opportunities and programs that Penn State has to offer. Students enjoyed the Abington campus and were able to use the gym, tennis courts and explore the beautiful woodsy surroundings.

Abington and Bucks County Cooperative Extension benefitted from this program because it has provided the opportunity to work together and for the campus representatives to build a relationship with the Principal at Clara Barton school. We hope to work together on more projects in the future.

Accomplishments and Impacts

There were many benefits to offering this program. The first was the opportunity given to the participants. A group of bright youngsters who would not normally be exposed to technology was intellectually challenged. None of the participants had been exposed to this sort of program before and were very enthusiastic about the material covered. Students had to work in groups of three which gave them exposure to cooperating together on their projects. As one student stated about things learned, "Teamwork because before I had no teamwork skills and now I have learned how to work together." We also wanted to demonstrate that computers are exciting and that a career in the science, engineering, and IT field is an attainable goal. From the evaluation results, participants seem to feel that science and computers are fun, but this is not statistically relevant since we don't know how many of them liked science before coming to the camp.

Resource Committment

The program received support funds through the Outreach Partnership Fund at Penn State University due to the collaboration of Cooperative Extension and a Penn State branch campus. The Penn State Abington campus provided food and snacks for all participants.

Collaborators

Penn State Cooperative Extension-Bucks County
Penn State Abington Campus
Clara Barton Elementary School

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